CLAIMS

1. A method for the removal of contaminating materials from pipework, said contaminating materials comprising deposits on the pipework which comprise inorganic salts having low solubility levels, wheirein said contaminating materials cause a reduction in the effective internal diameter of the pipes and thereby effect a reduction in the rate of flow of a fluid through the pipework, the method comprising treating said contaminating materials with at least one carbamate salt.

2. A method as claimed in claim 1 wherein said inorganic salts are deposited from solutions or suspensions in contact with the pipework.

3. A method as claimed in claim 1 or 2 wherein said inorganic salts comprise phosphate, alkylphosphate, molybdate and phosphomolybdate salts.

4. A method as claimed in claim 3 wherein said salts comprise the phosphate, butylphosphate, molybdate and phosphomolybdate salts of zirconium, tellurium, gadolinium, caesium, iron and uranium.

5. A method as claimed in any one of claims 1 to 4 wherein said contaminating materials comprise partial or total blockages of the pipework.

6. A method as claimed in any preceding claim wherein said carbamate salt comprises an aqueous solution of a carbamate salt.

7. A method as claimed in any preceding claim wherein said carbamate salt comprises ammonium carbamate.

8. A method as claimed in any one of any preceding claim wherein said treatment is carried out at a temperature in the range of from 40°C to 60°C.

9. A method as claimed in claim 8 wherein said temperature is in the region of 60°C.

10. A method as claimed in any preceding claim wherein said treatment is continued for an extended period of time.

11. A method as claimed in claim 10 wherein said treatment is continued for at least 2 hours.

12. A method as claimed in any preceding claim wherein the concentration of said carbamate in aqueous solution is in the range of from 0.3M to 6.0M.

13. A method as claimed in claim 12 wherein said concentration is between 1.0M and 3.0M.

14. A method as claimed in any preceding claim wherein said treatment is carried out in the presence of at least one additive.

15. A method as claimed in claim 14 wherein said additive comprises a carbonate or bicarbonate salt.

16. A method as claimed in claim 15 wherein said carbonate or bicarbonate salt comprises caesium carbonate or ammonium bicarbonate.

17. A method as claimed in any preceding claim wherein said treatment is preceded by pre-treatment with acid and washing with water.

18. A method as claimed in claim 17 wherein said pre-treatment and washing is carried out at room temperature.

19. A method as claimed in any one of claims 1 to 16 wherein said treatment is followed by post-treatment with acid and washing with water.

20. A method as claimed in claim 19 wherein said post-treatment and washing is carried out at room temperature.

21. A method as claimed in any one of claims 17 to 20 wherein said acid comprises nitric acid.

22. A method as claimed in any preceding claim whenever applied to the removal of contaminating materials from pipework in the nuclear processing industry.

23. A method as claimed in claim 22 which comprises the treatment of pipework used in the processing of Highly Active Liquor with an aqueous solution comprising 0.3-1.0M ammonium carbamate and 0.2M caesium carbonate at 60°C for 2 hours.

24. A method as claimed in claim 22 which comprises the treatment of pipework used in the processing of Highly Active Liquor as follows:

(a) treatment with 2.0M nitric acid at room temperature; followed by

(b) washing with water at room temperature; followed by

(c) treatment with 1.0M or 3.0M aqueous ammonium carbamate solution at 60°C for 2 hours.

25. A method as claimed in claim 22 which comprises the treatment of pipework used in the processing of Highly Active Liquor as follows:

(a) Treatment with 1.0M or 3.0M aqueous ammonium carbamate solution at 60°C for 2 hours; followed by

(b) Treatment with 2.0M nitric acid at room temperature; followed by

(c) Washing with water at room temperature.